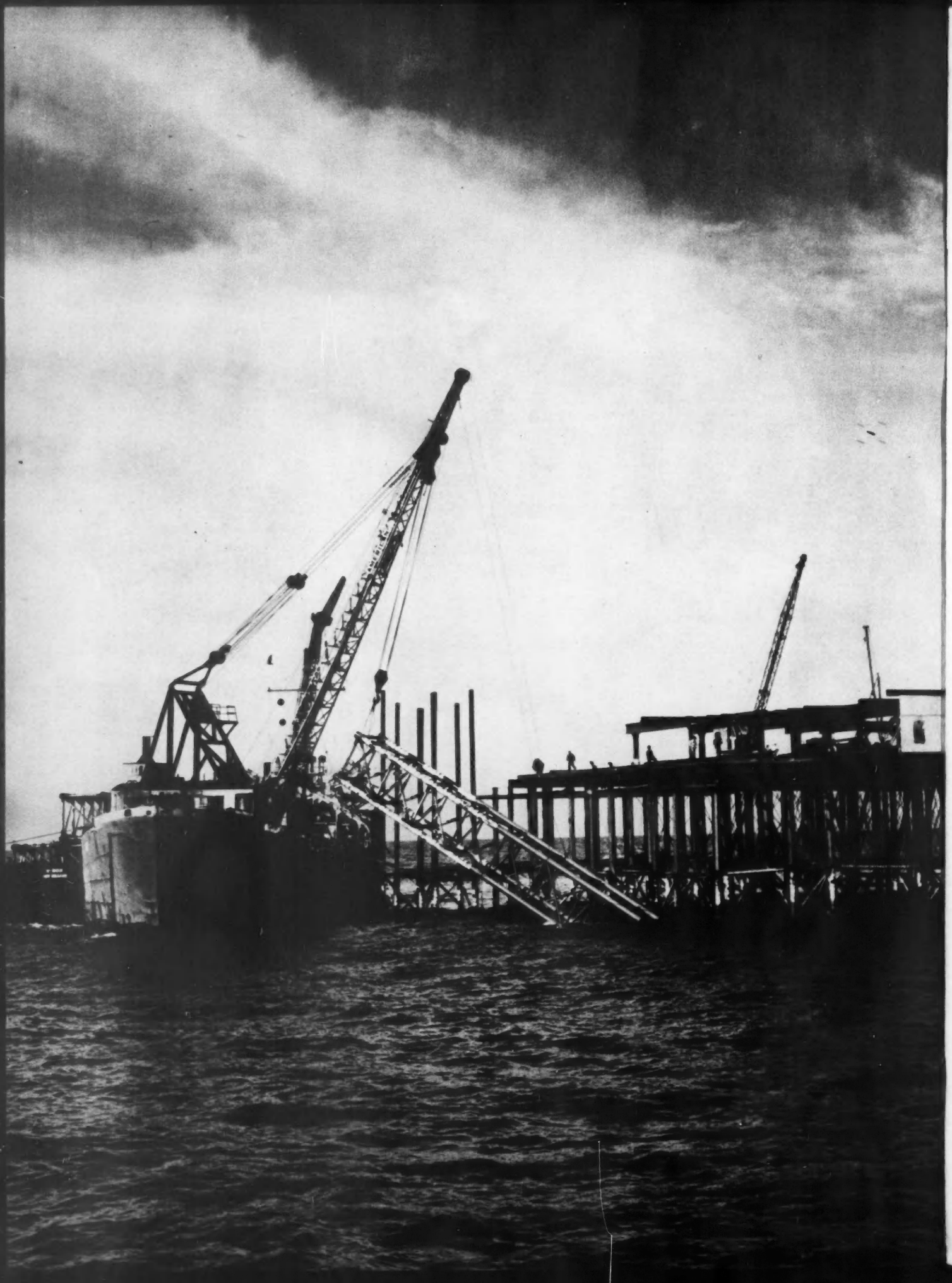
Gone With the Soil — *By E. M. Schiwetz*

The HUMBLE WAY

JANUARY-FEBRUARY, 1948



The HUMBLE WAY

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PLENTY OF COMPETITION IN OIL

Competition is the basis of American economic progress and high standard of living. It is the system in which individuals are free to enter any business they choose, to build "better mouse traps" in an effort to attract customers, and to charge whatever price they wish for their products. These prices, however, are subject to the action of competitors, who also have complete freedom to establish their prices. It is this competition in price, quality of product, and service that has proved so beneficial to American consumers by providing a great volume of goods and services at reasonable prices. In certain exceptional cases government acts to modify the general competitive pattern by laws defining "fair rules of the game" needed in the public interest; for example, control of oil production by the states as a conservation measure.

IT IS almost an understatement to say that the oil industry in the United States is highly competitive. *It is probably the most competitive major industry in the country.* American motorists and consumers of petroleum products have benefited by competition within the oil industry, which has been generally greater than in other industries. The U. S. oil industry has increased its production more than fourfold in 28 years, and continuous research has enabled it to produce new and better products at lower prices. Consumers have also profited from competition between petroleum and other forms of energy, such as coal, manufactured gas, and electric power. The increasing role of oil and gas as energy sources in the U. S. reflects the success of the petroleum industry in finding large new reserves and providing products at low prices. A major factor in that success has been competition.

There are more than 34,000 operators in the various phases of the U. S. oil industry, including 13,475 producers, 650 engaged in transportation, over 300 refining companies operating about 450 refineries, and 20,000 distributors and jobbers. Even though the public generally thinks that the large oil companies do most of the business, the fact is that such companies do a much smaller per cent of the total volume of business than is generally the case in other major industries.

Competition in Oil and Other Industries

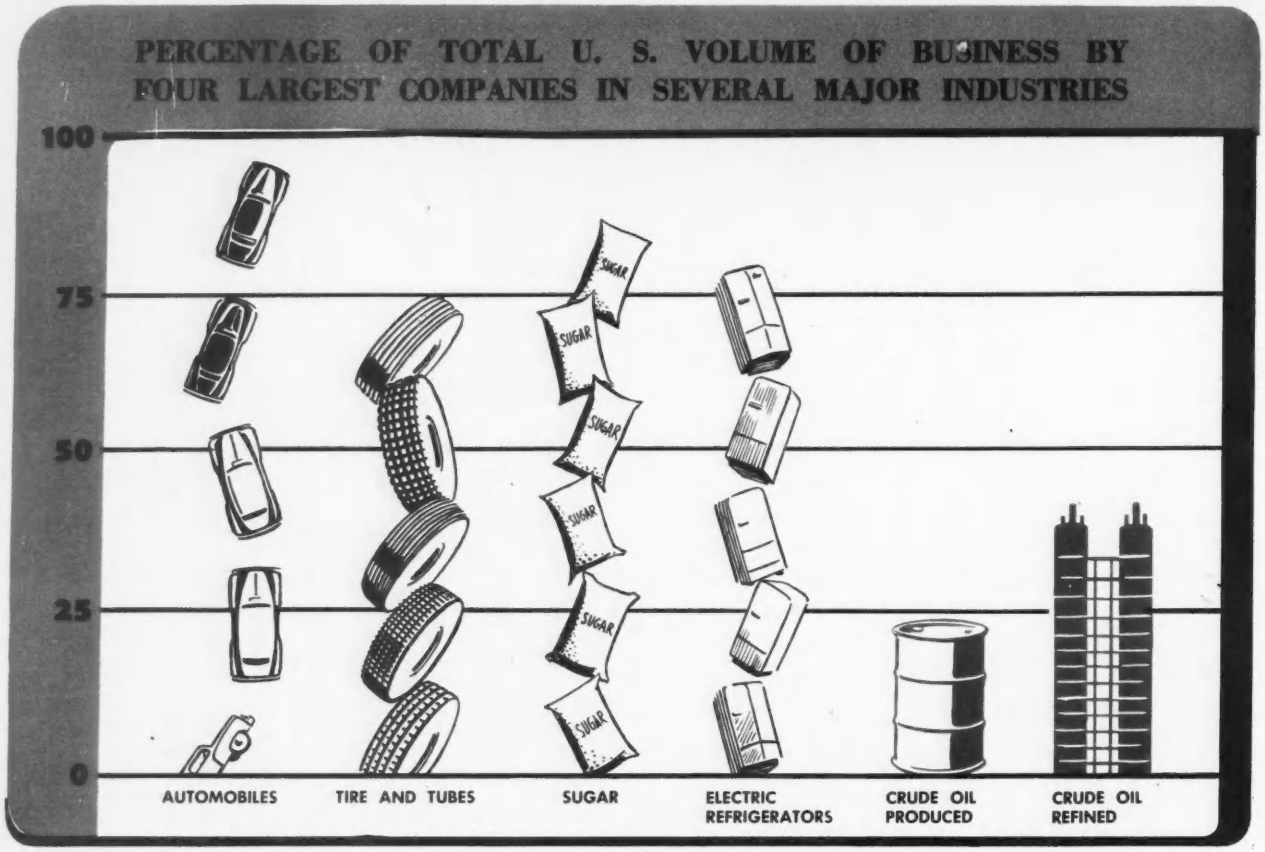
In practically every major U. S. industry, the per cent of total national volume produced by the four largest companies is *two or three times* that of the four largest oil companies, and frequently more than the per cent of operations by the 30 largest oil companies.

The four largest oil companies produce about 25 per cent of the total national supply of crude petroleum and refine about 37 per cent of total products. Not even the largest produces more than *nine per cent* of the total crude oil; not one of them, even with affiliated companies, refines more than *14 per cent* of the total products. By contrast, the four largest companies in most major industries generally account for 75 to 90 per cent of the total volume.

In foods, the four largest companies process 80 per cent of the sugar, 66 per cent of the meat animals for packing, and 90 per cent of the baby foods. In clothing, the four largest companies supply 90 per cent of the rayon staple fiber, about 77 per cent of all-cotton blankets and woolen and worsted fabrics, and 90 per cent of the silk velvets. In shelter and housing, the four largest companies produce 75 per cent of the plumbers' supplies, more than 90 per cent of the gypsum board, more than 75 per cent of the silica and glazed bricks, 100 per cent of the electric light bulbs, about 85 per cent of the aluminum and tin, and 100 per cent of the plate glass.

It is generally recognized that there is competition in the supply of food, clothing, and shelter; frequently very keen competition. Not only do companies in one industry com-

HUMBLE'S drilling platform almost eight miles out in the Gulf of Mexico is nearing completion. The complete story of its construction begins on page 15.



EVEN THOUGH the public generally thinks that large oil companies do most of the business, the fact is that the four largest oil companies in the United States do a much smaller percentage of the business than is the case in most other major industries. In fact, it would take the 30 largest oil companies to do as much business as the four largest companies in other competitive industries.

pete with each other, but they also engage in a struggle with other industries for consumers' favor and dollars.

A look at some of the other industries which supply the comforts and pleasures of life reveals the same pattern. The four largest companies produce 90 per cent of the total U. S. supply of photographic film, 85 per cent of the cigarettes, 90 per cent of the automobiles, 80 per cent of the soaps, 77 per cent of the electric refrigerators, more than 75 per cent of the tires and inner tubes, and about 85 per cent of the rubber boots and shoes.

Why is it, then, that some people cling to the fallacy that the oil industry is a monopoly? Could one of those reasons be similarity of names—such as the name "Standard Oil"?

Competition Among Standard Oil Companies

Most people think that all companies operating under the name "Standard" are one big company. That is wrong. Possibly such thinking is a holdover from operations prior to 1911, when the Standard Oil Trust controlled about 70 per cent of the U. S. refining capacity and was found guilty of violating the Sherman Anti-Trust Act because of the practices it used to restrict competition. Monopoly, of course, is not a question of size, but of conduct. The essence of monopoly is its efforts to stifle competition.

Since the Standard Oil Trust was dissolved by decree of the U. S. Supreme Court in 1911, the Standard oil companies of New Jersey, California, Indiana, Ohio, etc., have been—and are today—*separate and independent companies.* Each is trying to improve its own position at the expense of others by seeking more marketing outlets and by competing for crude oil production. Along the Atlantic coast, for example, several of the units which were part of the old Standard Oil Trust, such as Socony-Vacuum, Standard Oil of New Jersey, and Atlantic are in keen competition with each other for the same markets.

But, just for the sake of argument, *suppose* for a moment that all the Standard companies *were* one big company. In that case, *they would still account for only 23 per cent of total crude oil production in the United States, and only 36 per cent of refinery crude runs to stills.* If such a situation actually existed, it would be comparable to General Motors' 35 per cent of the national output of automobiles. Yet no one supposes for a moment that General Motors has a monopoly on the automobile business.

The Influence of Competition on Gasoline Prices

If not size of individual organizations or similarity of names, what causes people to underestimate the competition in oil? One more possible reason remains: the tendency for prices of petroleum products to become uniform in the same general marketing area. Does this tendency indicate lack of competition? Definitely not! On the contrary, it is one of the signs of real competition which prevents one company from charging more than its competitors.

When there is a surplus of supply, competition for markets leads one company to cut prices and this causes others to meet such prices in an effort to hold their share of the business. Lost business runs up costs and tends to reduce incomes. In a tight supply situation, on the other hand, high demands for products may lead one company to raise its prices. This price increase may or may not be met by competing companies, depending upon whether the change is a correct evaluation of the market forces.

For example, following a rise in the price of crude oil on March 10, 1947, which thereby increased the cost of gasoline. Gulf initiated on March 16 a price increase of one-half cent a gallon for gasoline in the State of Texas. In the course of the next week, The Texas Company, Humble, and others increased their prices by one cent per gallon. This latter view as to the price needed for profitable marketing did not prevail for long. By April 12 Humble and others had to reduce their prices one-half cent a gallon back to the level first announced by Gulf. The reason for this change, beyond doubt, was that the difference in price was affecting the sales of the companies with the higher prices. This illustration shows how competition tends to bring about uniformity of prices paid for similar products in the same marketing area, whether the general trend is up or down.

Why Gasoline Prices Are Relatively Uniform

Oil companies do not fix retail gasoline prices at service stations, except in the minority of cases where they own and operate stations. Generally, they sell their products at wholesale prices to dealers, who are independent business men just like the corner druggist or grocer, the automobile dealer, and the distributor of all sorts of appliances. These dealers are at liberty to sell gasoline and other products for whatever price they choose, or at whatever price the traffic will bear. But right there is the limiting factor. The traffic will generally bear no more than the lowest price charged by service stations in the same locality, quality of product being the same.

This, of course, is true of all consumer goods that are very similar in quality. Such items must necessarily be sold at virtually the same price, or buyers will flock to the retail outlet which sells for the lowest price. This situation is clearly explained in the book, *Price and Price Policies*, by Walton Hamilton, Professor of Law at Yale University, in the following language: "The little gasoline seller in the alley, with a single pump, can cause tremors through the industry. With his invested capital of a few hundred dollars he can send chills through the $100,000,000 company. Possessing but a pittance of the total gallonage, he can—and on occasion has—set the price for all the gasoline in the adjacent area."

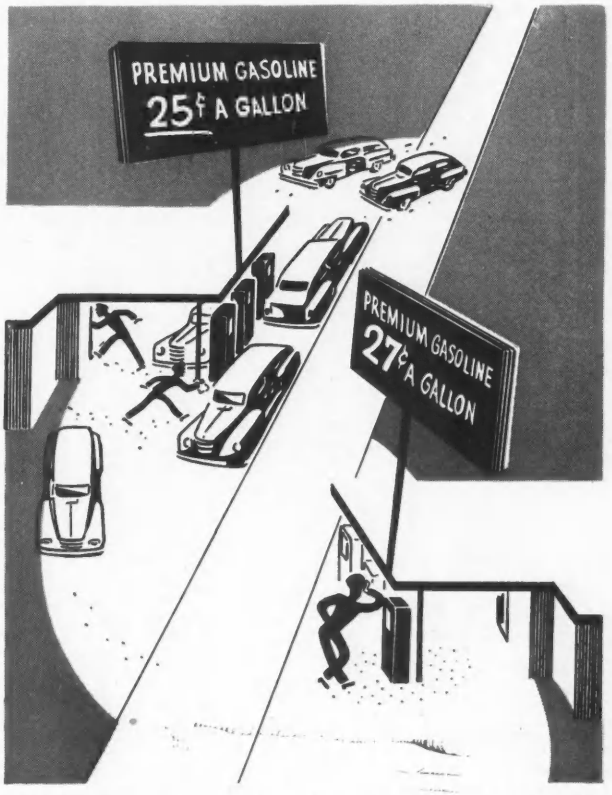
The chapter on "Gasoline—The Competition of Big Business," in Professor Hamilton's *Price and Price Policies*, describes the operation of competition in gasoline marketing as follows: "A drop in price at one station attracts gallonage so quickly that other dealers within a radius of several miles must cut to hold their customers. This situation is due to the type of commodity and the nature of its marketing arrangements. With drugs, groceries, and clothing price differences may persist through inconvenience in reaching the source of supply. With gasoline, the purchaser has easy access to even a relatively distant retail outlet. His vehicle is in motion; a few miles are of little significance; the pleasure trip is the justification of the longer ride; the few cents saved are accounted a net gain."

It was perhaps this sort of price competition in petroleum marketing which led John S. Bonner, former vice president of Humble Oil & Refining Company and known affectionately among his associates as "Uncle Johnny," to remark: "The only thing wrong with refineries is that they can't make gasoline as cheap as sales departments can sell it."

That states the case for price competition very well. It should not be hard to understand that the same economic forces which keep the prices of different brands of chewing gum and cigarettes in line must also keep gasoline prices virtually the same in any given trade area, where transportation costs are comparable. It so happens that gasoline is a commodity which most consumers consider to be of almost uniform quality. Even though there are differences in specification of gasoline, such differences are generally not immediately noticeable to the average motorist. It is the exception for one brand of gasoline to be so different that consumers immediately notice the difference.

The Influence of Capital Investment on Size and Competition

The oil industry is not closed to new operators and investors, once more bearing out the case for competition in oil. The field is wide open for newcomers, and the extent of their participation is limited only by the amount of money they have to invest. The amount of competition in oil, as in any activity, is influenced by the capital required as an initial investment. In marketing petroleum products and in producing crude oil, the funds required to start are smaller than in refining and transportation; so, naturally, there are more operators in the former phases of the oil industry than in the latter.



COMPETITION keeps gasoline prices uniform in a given trade area. Service stations must charge prevailing prices or lose customers.

Today, anyone with $5000 (or even less) to invest can set himself up in the petroleum marketing business. During the last depression an unusually large number of individuals went into the service station business because it offered employment at a time when there were millions seeking jobs, and took less capital to enter than most businesses. The number of service stations increased by 50,000 during the depression. At present, there are about 215,000 service stations in the United States.

The great majority of these service stations are owned or operated by small business men and not by the large refining companies. These retailers display the signs of the brands marketed by large companies, because that is an advantage in attracting customers, but they are not controlled as to price or service by the company whose gasoline they sell. Relatively few stations are owned and operated by large refining companies even though their trade marks are such a prominent part of the American scene that many people think of gasoline as being marketed primarily by large companies, instead of by thousands of small firms.

Producing differs from marketing as an attraction for newcomers only in the amount of capital required. Anyone who wants to become an oil producer may take his chances at "striking oil" by leasing land, perhaps as cheap as a dollar an acre, and by hiring a contractor to drill a well. That well may cost as little as $20,000 or even less, but the newcomer had better be prepared to pay considerably more if the well has to be drilled deep or if other conditions are unfavorable. Even then, it may turn out to be nothing but a dry hole.

From a standpoint of initial investment required, the refining and transportation of crude oil are things quite apart from marketing and producing. In these two phases of operations, huge sums of money are required for capital equipment.

At present, it costs from $10,000 to $40,000 per mile to lay a pipe line, depending upon the size of the pipe and the terrain over which it is to be laid. Once built, pipe lines are common carriers. Anyone can tender oil to a pipe line for shipment and it must be accepted on a pro rata basis for delivery at a published tariff. Such lines are so constructed as to form a network of transportation from producing fields to terminals and refineries wherever there is a market for oil. Pipe lines bring the markets of the world to the wells.

Even greater investments are required for capital facilities in refining. A small refinery, processing 10,000 barrels per day, would cost from $10,000,000 to $15,000,000 today. Not many people or companies are in position to enter a business that requires so much initial capital investment.

The Department of Commerce reports that in 1946 there were 311 refining companies operating 453 refineries in the U. S. Of these refineries, 252 each had a crude charging capacity of less than 10,000 barrels daily. There were only 10 refineries in the U. S. whose capacity of crude runs to stills was 100,000 barrels a day or more. The size of these few refineries does not blunt the keen edge of their competition with each other and with the rest of the refining industry.

IT TAKES LARGE organizations to pay for the kind of research required in finding more oil, in developing new techniques, and in improving product quality. Large companies had to start as small companies; they have grown because of energy and efficiency.

The Merits of "Big Business" and "Small Business"

The mere fact that some companies are large does not mean that they serve the public less satisfactorily in price, service, and quality of product than small companies. In many cases, it is possible for large companies to perform better service for the public, to pay better wages, and to sell products at lower prices than would be possible if the organizations were small. In fact, it takes large organizations to bear the expense of carrying out the kind of research which has enabled the oil industry to find more oil, and to develop new methods and techniques leading to continuous improvement of product quality. Products have been supplied at lower costs to consumers because the industry operates on a mass-production basis, which reduces costs per unit.

People are sometimes inclined to be critical of big companies just because they are big. Such a view overlooks the fact that "big businesses" didn't get that way overnight. They had to start as *small businesses*, and they have grown because of their efficiency and energy; because of their ability to produce at reasonable costs some commodity which consumers need and want.

Competition and Achievement

The oil industry has done a magnificent job of supplying increasing quantities of products, in improving the quality of those products, and in delivering goods at low costs to consumers. Total U. S. production of oil has increased more than fourfold since 1920, and oil and gas have supplied practically all of the increase in energy production since that time. Consumers pay less for today's high octane premium gasoline than they paid for a much inferior product in 1920.

The facts show beyond a doubt that the oil industry is highly competitive—probably the most highly competitive major industry in the country—and that consumers continue to benefit from that competition.

ELEMENTS OF CHANCE in determining the nature and extent of supervisors' responsibilities are eliminated by a job analysis program.

SUPERVISORS GET a clearer concept of their duties, a better idea of what is expected of them, as their job specification is developed.

RESPONSIBILITIES which may have been uncertain are made clear, and duties are brought into focus by job analysis methods.

A Journey Into Human Relations

Job Analysis

Program for analyzing supervisors' jobs, tested experimentally at Baytown Ordnance Works during war, now in progress at Baytown refinery

People respond to questions in strange and interesting ways.

Take the polite banality "How do you do?" for example. More a pleasantry than a question, it is so worn with usage that it invites a ready-made answer. As if by reflex action, the average man summons up courage to murmur, "Fine, thank you," even though his wife may be ill abed, his mailbox may bulge with first-of-the-month bills, and taxes may harass him from all sides.

In that case, perhaps, a standard reply is forgivable, for it offers comfort and refuge to both questioner and questioned. It saves one the embarrassment of a candid answer and relieves the other from the boredom of listening to his neighbor's troubles.

But other questions are not so easily disposed of. Ask someone "What part do you play in your company or organization?" and watch matters get complicated. For there is a question that unleashes emotions and reactions ranging from humility and frustration to all the bromides of an unbridled ego.

There are as many types of answers to that question as there are types of men. One may be lackadaisical in his reply if he regards his work, grasshopper fashion, merely as a vacuum in his life between the hours of eight in the morning and five in the afternoon. Another may expound at great length and with crusading zeal, guarding and nurturing his authority as fiercely as a lioness defends her cubs. Somewhere between these extremes will be the well-balanced man who is willing to give credit that is rightfully due others, who admits mistakes and profits by them later, who is willing to accept new ideas if he finds them sound, who understands logic and reason when he hears them, and who combines energy, ambition, and ability to carry him forward to better things.

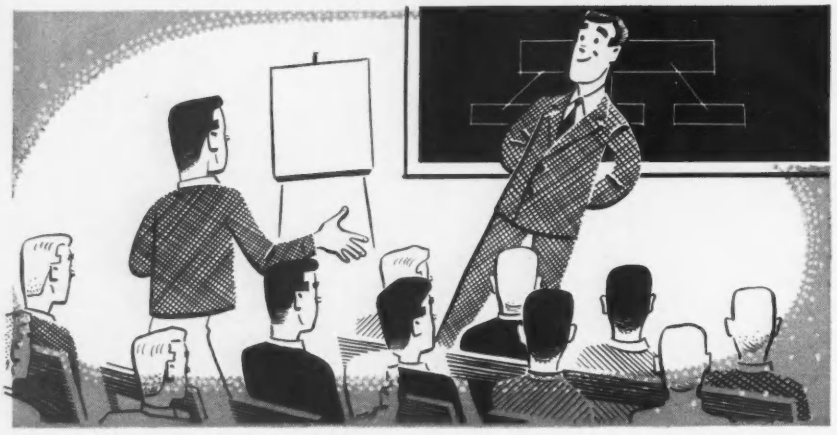
But one thing is reasonably sure: no matter who or what he is, it is hard for any man to answer the direct question, "What do you do?" completely and objectively, uncolored by fantasy and personal opinion. To give each supervisor a clear understanding of his position, Baytown refinery has been engaged for more than a year in a program of job analysis.

"Job analysis" and "job specification" are inadequate terms for the process of formulating job "blueprints" to show just what is expected of each man within an organization. They are terms far too cold and lifeless to describe work which actually is warm, alive, and extremely important to the human problem of training men in industry. But the handicap of inadequate terms has not held back the good work of job analysis. As its benefits unfold, it finds increasing favor among all levels of management.

Program Is Flexible

First of all, it should be clearly understood that job analysis does not purport to tie everything down and keep it there. There is a tacit flexibility which leaves the way open for future adjustments as needed. If rules of any kind prove unsuitable to changing conditions, those rules should be amended or scrapped altogether. So, too, should job specifications be changed when changes are needed.

If a flexible program of job analysis is properly and thoroughly developed, specifications may be made to serve partly as an end, as well as the means to



EVERY JOB specification is presented for open examination and discussion by a group of supervisors at the same level as the supervisor on whom the specification was drawn.

an end. Those on whom the specifications are being prepared get a clearer concept of their duties, because they take a principal part in the development of their own personal "job blueprint." And the blueprints, taken collectively in their final form, become the means to an end by pointing out the need for certain adjustments and future training.

It is job analysis of this type, the happy combination which serves as both end and means that is now in progress at Humble's Baytown refinery. Members of the training group, under whose direction the work is coordinated, first put it into practice at the supervisory level during the war at the Baytown Ordnance Works. The experiment went so well there that the program was carried over into the refinery proper.

Fertile Field for Program

Baytown refinery offered a particularly fertile field for job analysis. Beginning as a small 10,000 barrel a day plant in a muddy rice field, it has in 28 years become the largest petroleum refinery in North America. The number of employees had increased from a hundred or so in 1920 to more than 6000 in 1945. World War II, of course, brought the need for fast and unusually heavy expansion of plant facilities, and, to handle the new volume of work, it became necessary to make large scale additions to the supervisory staff. With a greatly broadened base of duties at the supervisory level, some means for establishing clear-cut and workable job patterns for all supervisors, new and old alike, was necessary.

A member of the training group meets with each supervisor to discuss with him the following points about his work: (1) What is the basic function of the supervisor's group? (2) What is their basic equipment with which to do the work expected of them? (3) What is the authorized organization of the group; that is, what manpower does the supervisor have? (4) What are the supervisor's general objectives and responsibilities? (5) How, or through what means and controls, should he reach those objectives and discharge those responsibilities? (6) What are his relationships with other units in the organization? (7) What is the extent of the supervisor's authority?

Here, admittedly, is work which takes time and allows no snap judgments. Even when the supervisor, aided by the representative from the training group, has developed a specification to his own satisfaction and to the best of his knowledge and ability, the job is not complete. First, the specification must be validated by the supervisor's department head, and then it is presented for open examination and discussion by a group of supervisors at the same level as the person on whom the specification was drawn.

Good Results Expected

This process serves one of the main purposes of job analysis: *that of clarifying and strengthening each supervisor's position.*

By reducing his job to writing, each man brings his duties and responsibilities into sharper focus, not only for others, but for himself. He becomes increasingly alive to the reasons for job analysis, increasingly aware of what a good supervisor in his position should do.

Some results are obvious, if not inevitable. For one thing, it is almost impossible, without job analysis, for every supervisor to be entirely clear and positive about each of his responsibilities. The extent of some of his duties and authority may be open to interpretation. Some aspects of his relationships with others in the organization often need clarification; some of his authority may need support. When the entire program is completed at Baytown, it is expected that duplications and overlappings, as well as certain skips and gaps, in authority will be brought to light. Curative measures, if they are needed, will be left to management.

Benefits for All

From even this brief look, it is apparent that benefits are almost certain to be in store for all concerned. Management will be provided with definite information as to where clarification of responsibility and authority is required. It may be, too, that the need for certain specific training courses will be indicated. If so, it is believed that such courses will hit nearer the mark than training courses of a general nature. Infantry training, for example, is effective enough in itself, but it would be a waste of effort to give nothing but infantry training to every man in the Army. Refinery work is highly specialized, and Baytown believes in training a man specifically for the job he is supposed to do.

For the supervisor himself, the program holds promise of much good. Those of his responsibilities which may have been clothed to the slightest degree in uncertainty are made clear, and he is given definite direction. Certain duties which may have been more or less assumed or obscure are brought into sharp focus and made specific. Authority which may have been open to interpretation or dispute is finally established in writing.

In the final summing up, the program of job analysis at Baytown (1) gives each supervisor an opportunity to sit down and take a complete and impersonal view of his own job, (2) makes possible an understanding of the other man's job as well as his own, (3) removes doubt by showing each man at least the minimum requirements of his position, and (4) points the way toward specific courses of instruction and future training.

What the Soil Means to Texas

People on the land and in cities show growing interest in broadening conservation program

TEXAS has occupied for some time a position of leadership in the production of minerals; and in recent years many new manufacturing industries have added to the already important industrial picture.

But Texas is still primarily an agricultural state. Texans, like people the world over, depend for their existence largely on the products of the land. Food, clothing, and much of the material to supply shelter come from the soil.

More than 34 million acres of Texas land are in cultivation, and 87 million more acres are classed as pasture land. On the surface of these millions of acres there are 400 soil series and more than 1,000 identified soil types, according to Edward H. Templin of the Texas Agricultural Experiment Station. This is the greatest variety of soils possessed by any state, and it is the state's greatest resource.

A full appreciation of the significance of Texas soil lies in what that soil produces. Cash income from crops and livestock and livestock products in 1946 was $1 billion, 356 million, according to *Farm & Ranch* Magazine. That figure does not include what was consumed on farms and ranches.

This enormous production comes largely from the thin layer of topsoil which averages less than a foot in depth the state over.

Conservation experts estimate that in the rich black land belt of central Texas an original 14-inch topsoil has been worn down to eight inches. Over Texas generally, a virgin topsoil average of from eight to ten inches has been reduced to between 6 and 8 inches.

This topsoil is more vital than most people realize. How tragic the loss of even an inch of it may be is dramatically brought home by this scientific fact: it takes from 400 to 1,000 years to build an inch of topsoil. However, man working with nature can build six inches of surface soil out of sub-soil in five years, according to Dr. Roy L. Donahue, Extension Service agronomist.

Soil conservation and soil building, then, are of paramount interest and concern to everyone in Texas.

Various state and federal agencies are devoting time and expert talent to this significant task. The Extension Service of Texas A. & M. College, since its beginning in 1914, has encouraged soil conservation through demonstrations of its effectiveness. It has brought to the landowners the results of tests and experiments made by the Texas Agricultural Experiment Station as well as that of federal agencies.

The Soil Conservation service, a federal agency established in 1935, has made possible a plan to help landowners by supplying technical assistance. The Agricultural Conservation Program, under the Production and Marketing Administration (the old AAA), has done much to encourage conservation measures through financial assistance to farmers and ranchmen. Cooperatively and in conjunction with a number of other state and federal agencies, they are helping landowners to see the urgent need for conservation.

These agencies are showing Texas people that everyone pays for erosion damage; that crop yields decline as erosion increases; that buying power and living standards drop; that large and small communities alike lose business; that erosion leads to abandonment, and abandonment means production loss and tax revenue loss.

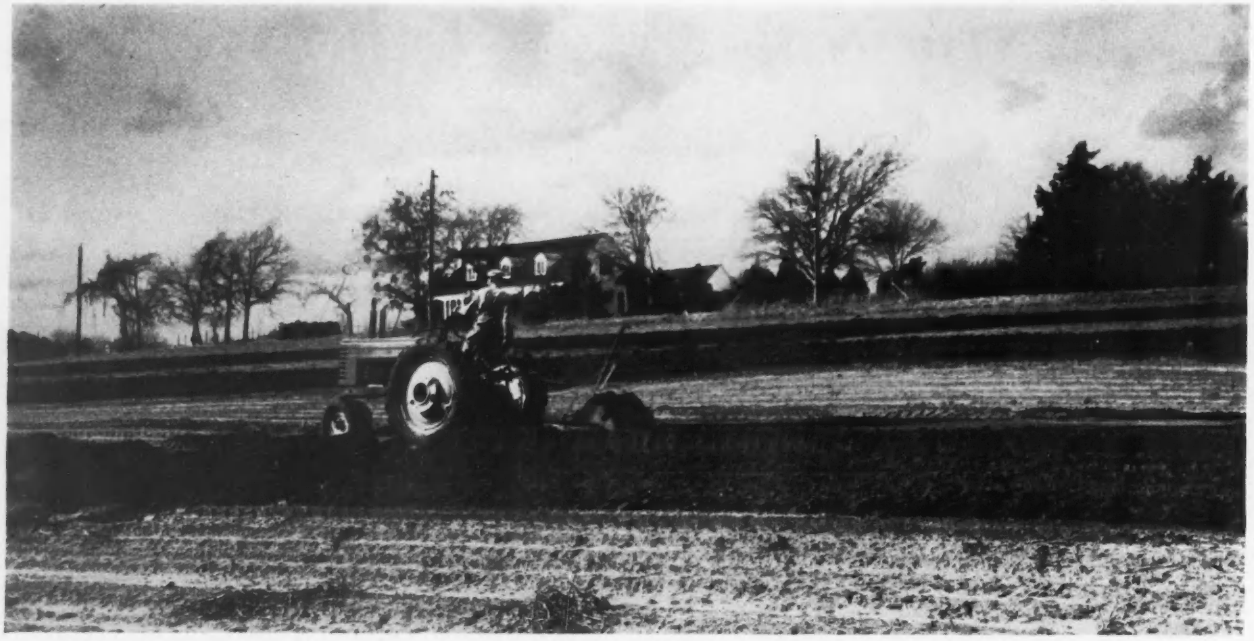
Moreover, they demonstrate that depleted soils cannot produce foods with the proper vitamins and mineral content required by plants, animals, and human beings. Research projects show that there are definite health belts which parallel soil fertility belts. From the chief of the Medical Division of Selective Service comes a report that seven out of ten men examined, from some areas of predominantly fertile soils, were found physically fit, and only three out of ten from areas with generally poor soils.

The far-reaching significance of soil conservation and soil building has gained many staunch supporters in Texas in recent years. Organizations comprised of bankers, business men, and industrialists have pledged their support in the current campaign to save and improve Texas soils. Large industrial organizations — implement manufacturers, oil, cotton, and chemical companies — are giving financial and other active support to the program aimed at improving soils and bringing scientific land control to more and more people.

For the welfare of all Texans it is well that the movement is gaining momentum and support. The Soil Conservation Service has determined that less than one-half of the land in Texas is suitable for continuous cultivation, and that a large portion of it is in need of immediate and continuing erosion control measures and soil management practices.

Gone With the Soil

Artist E. M. Schiwetz painted this cover scene of desolation, where uncontrolled soil erosion had led to abandonment, in the eastern part of the state. Extreme cases like this are not common in Texas, but their existence serves to emphasize the need for and value of soil conservation practices being advocated and demonstrated to Texas farmers and ranchers by several state and federal agencies.



IMPROVED LAND, resulting from conservation practices and better methods, produces more. This in turn puts cash income in the hands of farmers and makes it economically possible for them to buy better equipment and to improve their homes or build new ones.

OBVIOUSLY SATISFIED with his cover crop of rye and volunteer vetch, the farmer at left explains to the soil conservation expert that cover cropping is improving his land. Thousands of Texas landowners have renewed pride and interest in their work because conservation is helping them and their families to help themselves to a better way of life.

To Farm and Ranch Owners

ALL over Texas business men are observing that farmers and ranchers are becoming better customers. Landowners are buying automobiles, clothing, and furniture; new and better tools and equipment; household appliances and other durable goods. Many more are improving their homes, or are building new ones.

The greater income they are receiving from their land, scientifically improved and managed, is making this possible. Nowhere can the evidence be assembled better than from reports of landowners themselves. A consolidated account covering 1,422 farms and ranches—all of them under a soil conservation districts program from two to six years—shows these results: increase in crop and pasture production, 39 percent; increase in range production, 13 percent.

That is where the extra buying power is coming from. Such representative farms and ranches are the ones on which entire families are enjoying life more; on which sound, proven conservation practices have opened the door to self-help and better living.

The new lease on life, financial and spiritual, which thousands of Texas farmers and ranchers have gained from the soil conservation movement is of profound importance. Many had despaired; had about resolved to join the trek to the cities. The soil had been their livelihood; farming or ranching had been their business. But eroded fields and pastures, outmoded methods, and low returns had sapped their interest, their desire to continue.

Given scientific technical aid, encouragement, positive demonstration, and in many cases financial help by the various agencies engaged in soil conservation and soil improvement, hundreds of farmers and ranchers again are becoming productive, happy, and progressive members of their communities. They have a renewed pride. Living by the soil once again is the satisfying profession they had always believed it to be.

To City Dwellers

PICTURE an oil company office employee in one of Texas' cities, seated at the dinner table with his family. A glass of milk stands by each plate; tempting slices of roast beef fill a large platter; golden carrots and a dish of palatable green spinach round out what should be a nourishing and balanced meal.

But is it? Suppose the vegetables were grown in soil that is lacking in proper minerals? And what if the animal from which the roast was cut and the cows from which the milk came have grazed on land that is deficient in one or more of the elements essential to produce nutritional grasses? The meal may well be appetizing, but it would be a better meal for adults and children alike if the foods had come from well balanced soils.

It is a scientific fact that plants require 14 elements for growth and reproduction. People and animals require these 14 and four more—cobalt, iodine, sodium and chlorine. Of these 18, calcium, iodine, phosphorous, and iron are most likely to be deficient in ordinary diets and rations, says Dr. Roy L. Donahue, Extension Service agronomist.

Calcium and phosphorous are the two in which food and feed crops are lacking most frequently. Iodine in soils, drinking water, food and feed crops varies considerably and is closely associated with simple goitre in people and animals. Iron is always present in the soil, but often *available* iron is insufficient for healthy plant growth.

Great areas of Texas soils today are deficient in calcium and phosphorous. Therefore, plants and animals grown in those areas are almost certain to be deficient in those minerals.

How can this be remedied? First, by stabilizing the soil, then adding needed minerals. This means soil analysis, proper fertilization, crop residue management, cover cropping, conservation crop rotations, proper management of grass and woodlands, with other measures which have been applied successfully to thousands of Texas farms and ranches.

But the Texas city family depends on the soil for more than food. Clothing comes from cotton and wool grown in the state; housing from Texas grown timber; probably the evening paper is printed on newsprint made from Texas pine.

So, the city family's future rests almost as surely as does that of the farmers and ranchers who make their living from the land on the hillsides and in the valleys, in the pastures and woodlands of Texas.

QUALITY FOODS can be grown only on good soils. Because this is true city folks have a real personal interest in the productivity and conservation of the state's farm and ranch lands.

To Industry

AN INDUSTRIALIST flying across Texas looks with satisfaction upon the pleasing pattern of a contour planted, strip cropped farming area below. Here, he realizes, literally is his meat and bread. Does he also understand that here is the meat and bread of his and other industries? The source of much raw material, and a sizeable segment of the market for manufactured goods?

RAW MATERIALS for industry come largely from the farms and ranches. The state's rural population also forms a large part of the market for industry's manufactured goods.

Texas leads all other states in the production of cotton, wool, and mohair. Texas grows more cattle and rice than any other state, and ranks high in the production of timber, wheat, corn, and oats. Texas grows more than one-half of the nation's grain sorghums.

The wheels of many large industrial plants, in Texas and elsewhere in the nation, are kept turning because Texas soils produce such enormous quantities of raw materials.

To produce and bring to market these record yields, Texas farmers and ranchers have turned more and more to mechanization in recent years. The farms and ranches have become an increasingly rich market for tractors and trucks, farm tools of all kinds, machines, petroleum products, and a host of other products of industry.

Tractors on Texas farms on July 1, 1947, numbered 207,724, according to *The Progressive Farmer*. Combines, corn harvesters, hay balers, cotton pickers, and other time-saving units have become increasingly popular.

The U. S. Census of Agriculture for 1945 reported 142,000 Texas farm homes with running water, and 157,000 connected with electric high line power. What a vast market for all manner of fixtures, appliances, radios, and power tools!

But in addition to recognizing agriculture as an essential sources of raw material, and the rural areas as a big market for its output, industry has still another stake in the soil.

Mass production industry calls for large concentrations of workers, generally in cities. They have neither the time nor the space to provide their own food. How dependent they are on the farmer is demonstrated by this fact: the average farmer in America produces enough food for himself and for 19 non-farming people.

TOMORROW'S FARMERS and homemakers are learning in school about the importance of the soil and about the relationships between productive soils and good homes. Unlike the present generation, these youngsters will not have to learn conservation philosophy by costly experience.

To Future Texans

THE man who cultivates the soil follows one of the world's oldest occupations. His is a heritage that is passed on from generation to generation, and his is therefore a more sacred trust than is commonly recognized.

All of society shares an obligation to posterity, but the farmer is singularly charged with the greatest responsibility. The land, if properly managed, is permanently reproductive. Today's owner, although he holds a deed of ownership from the state, is but its temporary custodian. Tomorrow that same land will occupy the time and attention of another generation; will feed and clothe and provide shelter for the youngsters who romp and play today.

Soil conservation, including the maintenance and improvement of soil productivity is not a temporary expedient; nor is it a plan to hoard for the future. It is a program aimed at restoring to high productivity those lands on which unscientific practices and negligence have caused erosion and depletion; and at fostering an understanding of the methods which will help protect the lands which have not yet been damaged.

Texas landowners who have experienced the blessings of this sound land use and soil building program recognize the threefold gain they have made: for themselves, higher yield per acre and a better standard of living; for the nation, a continuing healthy agriculture; and for their children, a more valuable inheritance.

The benefits of the program are being brought home to youngsters in school today. Children in rural communities and in many towns and cities are being taught the philosophy of soil conservation. Tomorrow's farmers and ranchers are learning early in life the facts about soil fertility, wise land use, and scientific methods of cultivation. Generations to come will not have to learn by trial and error or by discouraging experience as did some of today's landowners.

More than anything else, tomorrow's farmers and ranchers will need the encouragement and moral support of their own generation to protect the land and keep it producing at a level which has made Texas the leading agricultural state in the nation.

IMPROVED PASTURES feed more and better cattle (above), put better meat on more tables. Better and more fruit, grain, and fibre crops can be grown on soil enriched by cover crops.

COVER CROP of white Dutch clover is combined for seed (top) on the Waters S. Davis farm near Alvin. Disking vetch and rye cover crop, fertilized with 220 pounds per acre of superphosphate, in the 60-acre peach orchard of Dodd Alexander near Rising Star. Mr. Alexander, left, and L. K. Gregory, Soil Conservation Service technician, inspect residue after disking; residue conserves moisture and reduces run-off and erosion.

STRIP CROPPING on the E. P. Shephard farm. 11 miles south of Denton, and on nearby farms makes attractive aerial pattern. Young peach orchard and model chicken houses in lower left center; diversion terrace at left protects farm against drainage water from adjoining untreated land.

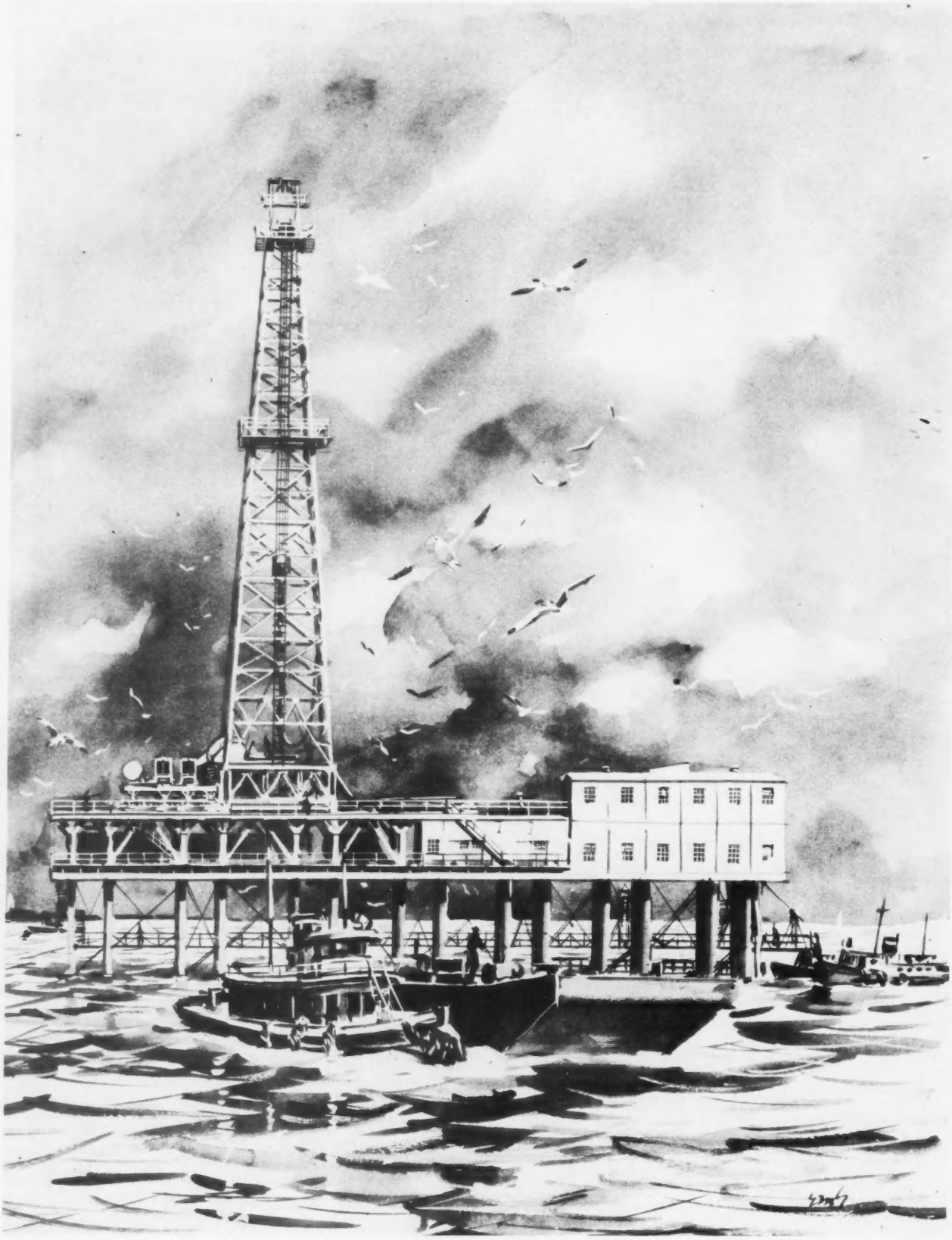
Texas Farm and Ranch Lands Being Improved

Texas farm and ranch people on November 30, 1947, had voted into existence 145 soil conservation districts covering 82.5 per cent of the state's area. In these districts about 19.5 million acres were included in more than 44 thousand plans involving such land improvement treatments as: terracing, contour cultivation, cover cropping, drainage, fertilization, crop rotation, strip cropping, irrigation, controlled grazing, spring and well development, woodland improvement, new and old pasture planting, and others. With educational and directive aid from the Extension Service of Texas A. & M. College; engineering and scientific aid from the Soil Conservation Service; and financial and supervisory assistance from other state and federal agencies, Texas farm and ranch owners have increased the productivity of millions of acres of land. Greater yields have brought greater prosperity to these landowners.

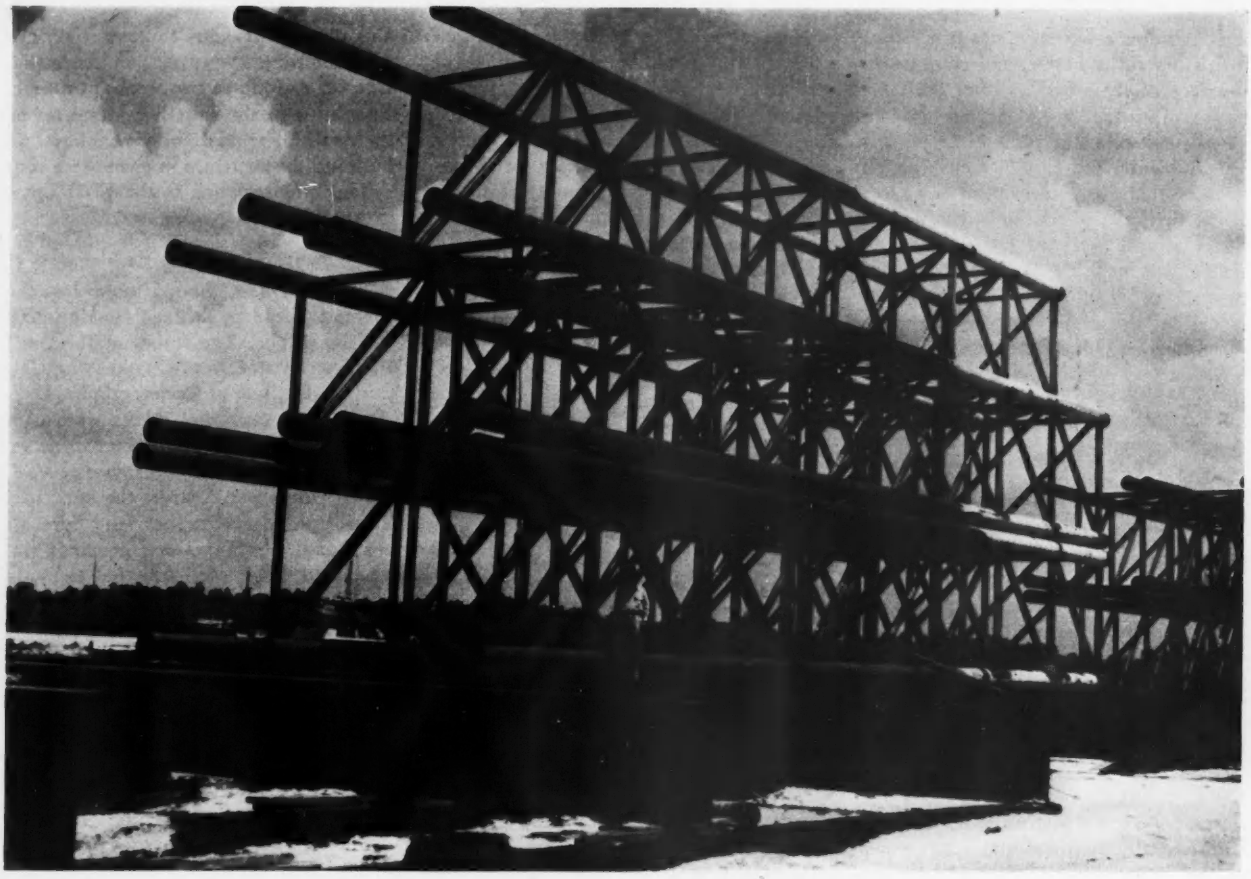
SOIL BUILDING is the appropriate term for the treatment being given this land near Bryan. Barnyard fertilizer is being spread in a field where winter cover crop is already growing.

PASTURE IMPROVEMENT is demonstrated by Joe T. Locke and Brazos County Agent Wallace Kimbrough. Properly fertilized, white Dutch clover thrives on comparatively poor soil.

TERRACE MAINTENANCE on the D. C. Becker farm near Brenham. State prize winning farm in 1936, it has today 12 miles of terraces and 21 concrete spillways to prevent erosion.



TOWERING HIGH ABOVE the blue waters of the Gulf of Mexico, Humble's big marine drilling platform will look like this wash drawing by Artist E. M. Schiwetz. The giant is under construction some eight miles off the coast from Grande Isle, La.



TREMENDOUS SIZE of templets is indicated by noting the man standing before them. Shown here stacked in New Orleans awaiting shipment to Grand Isle, these prefabricated templets serve as supports and guides for the piling driven into the bottom of the Gulf.

Giant in the Gulf

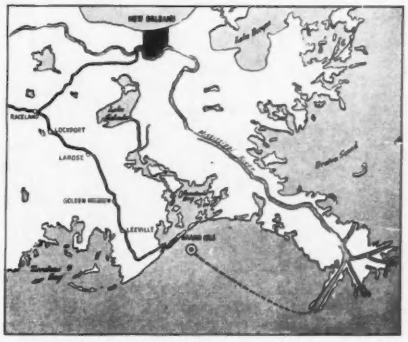
Oil beneath continental shelf to be sought from Humble's drilling platform in Gulf of Mexico

THE search for oil in Southern Louisiana has always been beset with more than ordinary difficulties; indeed, the boggy marshes and swamplands of that area have provided the oil industry with some of its greatest problems.

Still greater problems challenge further development of the state's oil resources. To supply the tremendous demand for more crude oil, the search for new oil reserves has been extended beyond the bayous to the blue waters of the Gulf of Mexico overlying the continental shelf. Attention is centered upon this newest oil frontier.

On Grand Isle, a long narrow strip of oak-studded sand some 45 miles south of New Orleans, there is a bustle of activity as Humble Oil & Refining Company's drilling platform eight miles offshore nears completion. Trucks roll up to the newly completed warehouse, and boats move busily to and from the great structure in the Gulf.

From the beach it seems as though a great ship, attended by a fleet of tugs and barges, has anchored on the horizon. The drilling platform appears big as it towers above everything in sight, and with every passing wave on the trip out comes a clearer realization of its true size. Picture an extra-heavy drilling rig on the tenth floor of the Humble Building in Houston: the derrick gin pole would reach up as high as the Humble flag pole, 255 feet high! When placed on location in the Gulf off Grand Isle, the four lower floors of the building would be under water 50 feet deep. The derrick floor, 60 feet above the Gulf, looks down on the two decks which measure 206 by 110 feet, each one-third the size of a football field. The lower deck is 32 feet above mean Gulf level, well out of reach of the highest waves.



It requires a big structure to support a drilling rig, its crew, and supplies in the face of the worst weather the Gulf can conjure up; to withstand the onslaught of potential 120-mile-per-hour gales driving waves 35 feet high. It is more than big, however. It is a challenge to the fury of the open Gulf in water almost twice as deep as any attempt yet made in the quest for oil beneath the continental shelf. Unprotected by shoals or reefs, "out where the water gets blue," this maze of steel must survive against all the forces of the sea to make it possible to probe for oil beneath the Gulf floor.

Living Quarters for 54 Men

It is possible to drill seven wells from this structure, whose two half-acre decks hold a complete rig and comfortable living quarters for 54 men. Arrayed on the top deck are quarters, racks for 15,000 feet of drill pipe and long strings of casing, and the specially reinforced derrick. This lattice of grey steel was designed to withstand hurricanes unassisted by guy wires, and has nearly twice the strength of its land counterpart. The mud storage room, living quarters, and well area on the lower deck are sheltered from offshore winds by thirteen fuel and water tanks on the seaward end of the structure.

Never before has anyone attempted to construct a stationary drilling island in fifty feet of water in the hurricane-swept Gulf of Mexico, where wind and sea fashion some of Nature's worst storms. There it must stand, anchored by its 100 piles, many of which bear up beneath loads of 250,000 pounds each, driven deep into the soft, silty clays below. Skin friction alone, between steel "H" beam piling and the soft alluvial soil, supports the 10,000,000 pound structure.

Because this is the first drilling structure to be built in the open Gulf in water deeper than 30 feet, a great many new problems arose in its design and construction. More new problems will arise in drilling from this platform, and the best engineering knowledge and skill have been mustered to solve them successfully. In all planning the worst conditions have been considered, and nothing has been spared to make this the safest possible undertaking.

Provide for Two Weeks Supplies

It was anticipated that there would be extended periods when rough seas would prevail, making marine transportation operations irregular. To cope with the weather, it was decided to provide for enough drilling supplies, food, and other provisions to permit unsupplied drilling operations on the structure for as long as two weeks at a time, regardless of the squalls and storms of the Gulf. The task of designing and building the structure to meet these conditions was assigned to the Civil Engineering division.

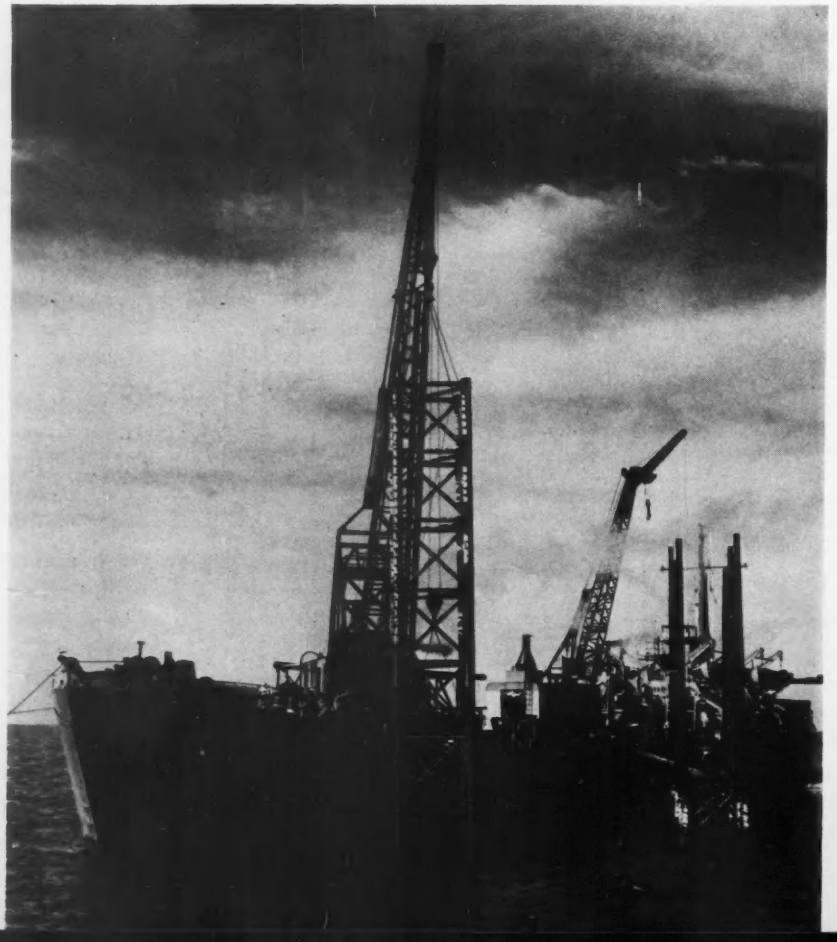
Sea Was Greatest Problem

From the first, the sea loomed as the greatest problem in constructing this drilling island. The forces of the Gulf, in deep water, were unknown. The Scripps Institute of Oceanography, U. S. Army Engineers, and others were consulted in gathering data on wave forces, wave height, and the frequency with which waves would strike the structure. The same oceanographer who forecast sea conditions for the Normandy invasion in 1944 was employed to study wave forecasting in the Gulf of Mexico. The results of these studies, together with the records of the U. S. Weather Bureau, unveiled the might and power of the elements.

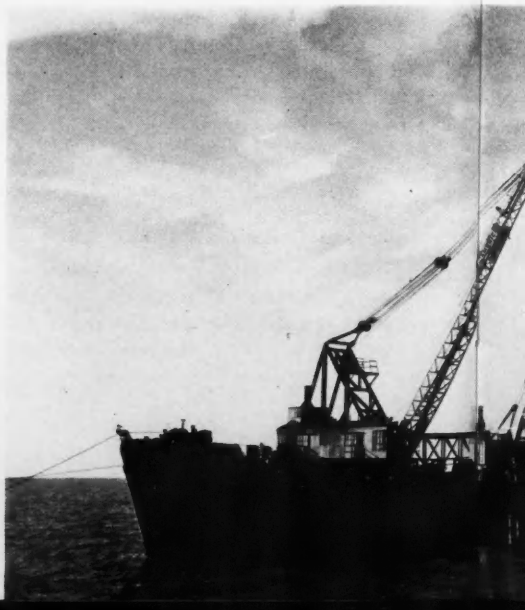
From these data engineers calculated the forces expected to affect the structure, and tests were made on the bearing of the soil beneath the Gulf. Six core test holes, one from the top of a 24-inch pipe test pile driven into the Gulf, were drilled in the vicinity of Grand Isle, providing information and samples of soil formations down to about 400 feet. The soft soil required unusually deep penetrations for piling, and the piles were driven from 147 to 197 feet into the Gulf floor, yet far enough above the first firm bearing stratum to permit uniform settling of the entire structure.

Designing the structure required extensive investigation, as nothing comparable had ever been built before un-

A TEMPLET is adjusted for final emplacement. Weighing 18 tons, the 72-foot long unit will sink 15 feet into the Gulf bottom. Note white fiberglas corrosion sheathing on upper half.



120 FOOT lead section of piling reaches skyward as it is "stabbed" into templet guide.



der such conditions or to resist such forces. After months of study, the most practical design proved to be a network of welded steel templets and braces mounted on piling. Templets are the 18-ton prefabricated sections which look like massive four-cornered ladders of pipe and serve as supports and guides for the piling. Turnbuckle rods and 8-inch pipe spacers between the templets brace the structure internally, topped by big 24- and 30-inch "I" beams supporting the treated timber decks. No guy wires or external braces of any kind help the structure resist the pounding of the Gulf, thus permitting boats to approach from any direction.

Construction of the drilling island, now in its final phase, began with the arrival of steel in the spring of 1947. Prefabrication of the 10-inch "H" piling and the tubular steel templets proceeded rapidly at the yard in New Orleans. Here the portions of the templets which would be subjected to the slapping of the waves were sheathed in corrosion-resistant layers of Fiberglas and tar. The remainder of the steel in the structure was coated with Humble Rust-Ban and enamel finishes.

Rough Weather Delayed Construction

The steel piling in lengths of 53 and 120 feet was loaded aboard the barge "CAP," a converted LST outfitted with two great cranes and a battery of welding machines. In the care of a tug and a converted LCI, the "CAP" and two LSM barges loaded high with the big templets sailed down the Mississippi for Grand Isle in mid-November, 1947. After some delay due to rough weather, the first pile was driven on November 30. Construction has progressed rapidly, speeded by refinements developed on the job. One of the most important of these is in anchoring and maneuvering the "CAP" by means of the five anchor lines, each of which is attached to two 11,000 pound anchors. Despite the loss of more than 15 days due to rough weather, the structure will be completed on schedule early in March.

Humble's Most Powerful Rig

Erection of the Humble company's most powerful drilling rig will begin even before the final completion of the structure. Two light-weight Diesel "quad" units, actually eight engines in all, will supply 1,200 horsepower to the new, extra-heavy drawworks. Three more Diesel "quad" units, chosen for their compactness and light weight-per-horsepower, will provide 1,500 horsepower to the three big mud pumps.

Skid-mounted units permanently mounted on the upper deck will permit cementing, well logging, and gun perforating as needed, thus eliminating delays and marine transportation problems which would accompany employment of mobile service units.

Nestled in the center section of the lower deck, shielded from the elements by steel wall panels, are the pumps and tanks of the drilling mud system. There three 200-barrel mud tanks, laced to the pumps with big 12- and 16-inch lines, stand beside thousands of sacks of mud materials. 1.620,000 pounds of drilling mud materials and cement may be stored here, enough to combat the most extreme subsurface pressures should they be encountered.

On the northeast corner, cushioned from rig noise by the mud storage area, are the quarters for the drilling crews. A dining room, kitchen, recreation room, and bedrooms for 34 men are provided on the lower deck, and directly above on the upper deck are seven more bedrooms and an office. The quarters are steam heated for winter, well ventilated in summer, with water and sewer systems to provide complete facilities for the comfort of the crews.

Safety Was Primary Consideration

Safety was the watchword in designing the structure. Although protection from the sea and the weather were paramount considerations, fire has not been overlooked. Fire nozzles are at strategic locations over the entire structure, supplied by a Diesel and an electric pump. Chemical and foam-type fire extinguishers are on hand also, and every precaution is taken to safeguard the use of Diesel fuel, the only combustible liquid on the structure.

Historic Grand Isle, many of whose inhabitants descended from Jean La-

TWO MEN steady a pile as welder "tacks" guide plates on templet before pile is lowered. Core test rig obtained soil samples from the platform atop the test pile in left background.

Three 53-foot sections are added as the pile is driven down. 100 piles anchor the structure.

LIVING QUARTERS ON THE LOWER DECK BEGAN TO TAKE SHAPE AS CONSTRUCTION NEARED THE HALF-WAY MARK

fitte's buccaneers, was selected early as a base for Humble's offshore operations which range 75 miles from the mouth of the Missisippi River to the Atchafalaya Bay. With Barataria Pass and Bayou Rigaud providing the only harbor which affords shelter from the open Gulf, centrally located Grand Isle is the only place in the area where the coast is accessible by road. Warehouse and office space and more than 400 feet of docking facilities and boat pens have been constructed on Grand Isle to support the offshore operations. Two harbors and a mile of channel have been dredged in Bayou Rigaud, and more than a mile has been dredged seaward from Barataria Pass to permit deep-draft seagoing tugs and barges to enter the harbor. Camp facilities, including a section of the beach, are being planned for future development.

Maintaining Supplies is Difficult Task

Supply is one of the most important considerations in the operation of a drilling rig eight miles offshore. Due to the lack of fresh water below ground, water for drinking and maintenance purposes, both on the structure and on Grand Isle, is one of the most pressing problems. It must be barged from New Orleans via the Mississippi River, a 24-hour trip. Food and drilling supplies also must be barged in or trucked the 120 road miles from New Orleans.

The specter of bad weather and rough seas is never far removed, and coordination of supplies and transportation is a difficult task. An oceanographer, employed by Humble, will provide continuous wave and weather information to the fleet of crew boats, tugs, and barges based at Grand Isle. Using data from the U. S. Weather Bureau, accurate forecasting of wave height and weather conditions will greatly enhance safe and efficient operations. The entire fleet is equipped with Very-High-Frequency (VHF) radio equipment, and radar sets are being installed in some vessels for safer navigation.

COMING ABOARD the structure from crew boat on one of the personnel landing ramps.

Perhaps the greatest difficulty in marine operations is in safely transferring men and supplies on and off the platform, and much time has been devoted to the problem. A significant development in this respect is the personnel landing ramp designed by the Petroleum Engineering division. There are four of these walkways, allowing boats to approach the protected side of the structure regardless of the direction of the wind and waves. The ramps, equipped with handrails, are mounted at each end to permit them to sway with the roll and pitch of the boats. The ease of transfer has proven the success of the design.

More Tests Are Planned

Drilling operations will soon follow the completion of this giant structure, and the wells to be drilled from this platform will be some of the first to seek oil beneath the continental shelf. These are the forerunners of many more tests now being planned by Humble and other companies. Thus, in pioneering the development of the potential oil reserves bordering the Gulf Coast, the experience gained in constructing and operating from this platform should prove valuable in future operations. Resisting the attacks of the Gulf and the weather is a great task in itself, yet the production of oil in the waters of the Gulf of Mexico depends upon the success of structures such as this Giant in the Gulf.

FROM THE CROW'S NEST of the barge "CAP" the noonday sun silhouettes the giant crane as it prepares to lower a templet into the Gulf. Three piles anchoring a templet already in place rise vertically as the other large crane leans out over the structure.

What Oil Means to Texas

Editor's Note: Dr. Richard J. Gonzalez, economist, recently prepared a significant booklet on the importance of the oil industry to the economy of Texas. This article was adapted for THE HUMBLE WAY *from the booklet.*

WHAT oil means to Texas is best understood in terms of what Texas means to oil; and despite the well-known enthusiasm of the average Texan when recounting the glories of his state and its leadership in many fields, it is a fact that the oil industry in Texas exerts a dominant influence throughout the world.

Known reserves of oil in Texas, for example, are greater than those of any foreign country. Crude oil production in Texas in 1946 exceeded the combined production of Venezuela, Russia and Iran, the three leading foreign producing countries. Texas has 105,000 producing oil wells located in 153 of its 254 counties. There are 36,500 miles of oil pipe lines in Texas. Refineries in Texas process about 30 per cent of the crude oil refined in this country.

In the light of Texas' importance in the world of petroleum, it would be difficult to overestimate oil's importance in the life and economy of the state, its effect on the development of Texas in the past, its significance in the present, its value to the future.

To Landowners

LANDOWNERS in all parts of Texas benefit from the bonuses, rentals and royalties paid by oil operators for the right to drill for and produce oil. It is estimated that the petroleum industry has under lease in Texas about 50,000,000 acres, or, roughly, one-third of the state's area. In many counties over 75 percent of the land is under lease. About 2,000,000 acres of this leased land have been proved for production.

As a general rule, landowners are approached for leases during or shortly after exploratory work. There is usually an initial lump sum payment, or bonus, for negotiation of the lease, followed by annual rental payments prior to the time of development; and after development, royalty payments to the landowner amount to about one-eighth of the oil produced.

Rental payments on undeveloped land vary widely, depending on the prospects of producing oil. Many leases call for a rental payment of $1.00 per acre; others provide for substantially more.

Bonus payments to Texas landowners may amount to $30-35,000,000 annually; in 1946, for instance, the University of Texas received $6,000,000 for oil and gas leases on some of its lands in West Texas. Lease rentals on nonproducing properties probably amount to $35,000,000 annually, providing an income from the oil industry to property owners throughout the state, even though commercial production will never be developed on some of the leased properties. Royalty payments to Texas landowners on the production of oil, natural gas and natural gasoline amounted to about $175,000,000 in 1946.

Total payments to landowners by the oil industry are, therefore, approximately $240,000,000 annually.

BONUS AND ROYALTY payments to Texas landowners amount to more than $200 million annually, making it possible for farmers and ranchers to improve their lands and their herds.

To the State

IN 1946, nearly one-third of Texas' total income of $6,500,000,000 was derived from operations of the oil industry, including marketing of oil products.

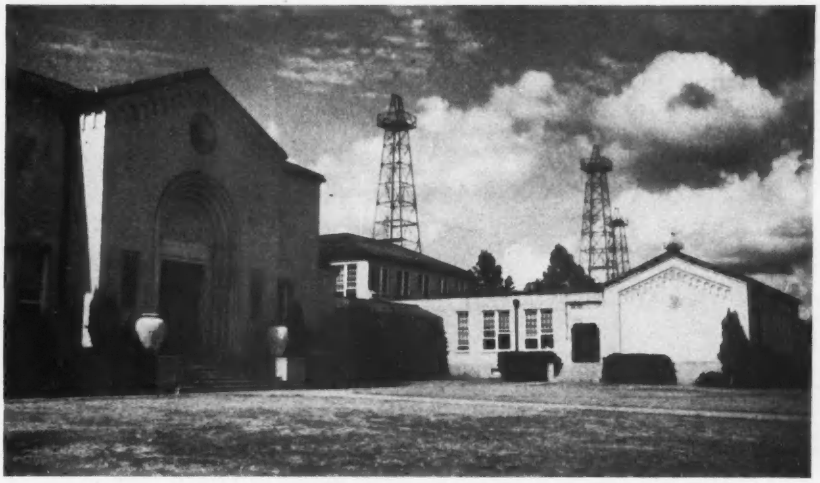
The value of oil produced in Texas in 1946 was $1,072,000,000 at the well, or about $1.41 a barrel. The value of transportation of crude oil within the state is estimated to be about $160,000,000, or 20 cents a barrel. The value of marketed production of natural gas at the well was probably $65,000,000. The value of products of natural gasoline and cycling plants is estimated to have been $90,000,000. The value added by refinery manufacturing of 503,000,000 barrels of oil was approximately $250,000,000. And the marketing of products, including transportation and distribution, probably added another $175,000,000 to the state's income.

Thus, the petroleum industry made a total contribution of $2,390,000,000 to the income of Texas in 1946.

Total Investment $4 Billion

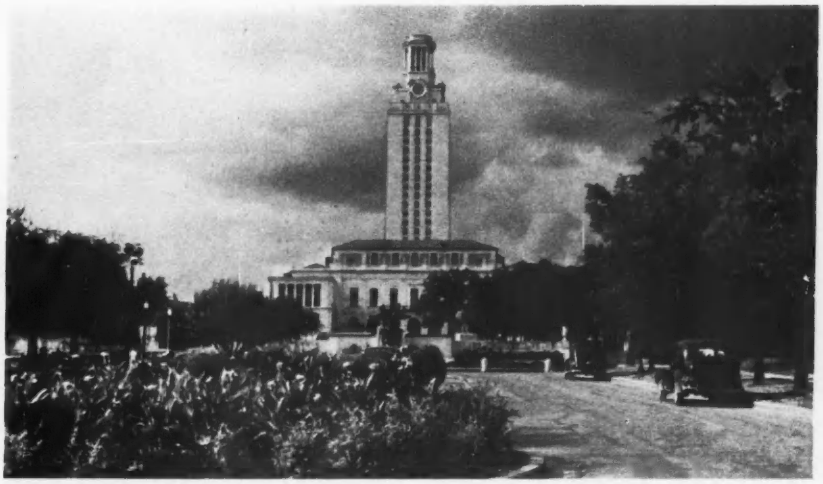
But that is only part of the story. Texas also benefits from the oil industry's investment which in some years, such as 1930-33, has exceeded the total value of crude oil production. The petroleum industry has so heavily re-invested its income in production and refining developments that today its total investment in Texas probably exceeds $4 billion, estimated to include $2,650,000,000 in producing wells, $330,000,000 in crude oil pipe lines, $875,000,000 in refineries, $105,000,000 in natural gasoline and cycling plants, and $220,000,000 in storage tanks and miscellaneous.

Direct payments to the State of Texas as production taxes on oil and gas were $41,191,000 in the fiscal year ending August 31, 1946, or one-fourth of the total revenue from taxes and licenses. In the same period, consumers paid the state net gasoline taxes of $56,374,000 to be used in highway construction and for the support of educational activities. Add these two figures, and you have over half of the tax revenue of the state. Additionally, ad valorem taxes on oil properties and other facilities of the oil industry provide large revenues to both state and local governments. The petroleum industry pays more taxes in Texas than any other industry.



PUBLIC SCHOOLS all over the state benefit from the state gasoline tax. Fine modern school buildings in a great many sections of Texas, both in rural and urban areas, have been made possible as a result of increased tax valuation of property on which oil has been found.

MODERN HIGHWAYS spanning the length and breadth of the state have been built largely with gasoline tax income. Expanding oil operations in recent decades have brought more prosperity to Texas. Taxes from oil operations now supply half of the state's revenues.



STATE INSTITUTIONS, educational and other, benefit materially from the total of approximately $100 million tax bill paid annually by the Texas oil industry. The University of Texas in 1946 received $6,000,000 for oil and gas leases on lands owned by the school in West Texas.

Laboratory technician

Pipe line gauger

Driller

To Employees

THE Texas oil industry offers a more varied employment to the people of Texas than any other industry within the state. Its operations are so diversified that the erudite scientist, the skilled craftsman, the clerk, the salesman, have equal opportunities for employment and, according to their capacity, for advancement. Most of the executives of Texas oil companies began their careers in the oil industry in the same jobs to be taken by some hundreds of this year's high school and college graduates.

Exploration, for example, attracts young men of a scientific turn. The relatively new science of oil geophysics employs about 2,350 Texans in field crews, with other trained scientists to interpret the data they secure.

In June of 1947, there were, in round numbers, 1,000 drilling rigs in Texas. Drilling operations are carried on 24 hours a day, and it takes 25 men, working a 40-hour week, to keep a rig operating. Thus the industry employs about 25,000 Texans in its drilling activities; their wages are approximately $80,000,000 a year, or some 20 percent of the total expenditure for wells.

After the development of a field is completed, employment is generally limited to those engaged in production activities. To produce oil from 105,000 wells requires an estimated 50-55,000 workers.

Thirty percent of all the crude oil gathering pipe lines and 40 percent of all the main lines in the United States are located in Texas. New lines are being built and the capacity of old lines increased as materials are available. Building these lines provides timely employment for thousands of Texans annually, and to operate them, additional thousands are employed.

Refinery runs in Texas amount to approximately 1,410,000 barrels of crude oil daily. This makes oil refining the most important manufacturing activity in the state; and it provides employment for about 35,000 Texans, and pays them more than $115,000,000 a year in wages and salaries.

And another 35,000 Texans are required to man the state's 15,000 retail outlets.

Excluding the retail outlets, the oil industry in Texas directly employs 135,000 men and women. They were paid in 1946 approximately $400,000,000, and were paid more than that in 1947.

Production geologist

Tankwagon salesman

Secretary

To Other Industries

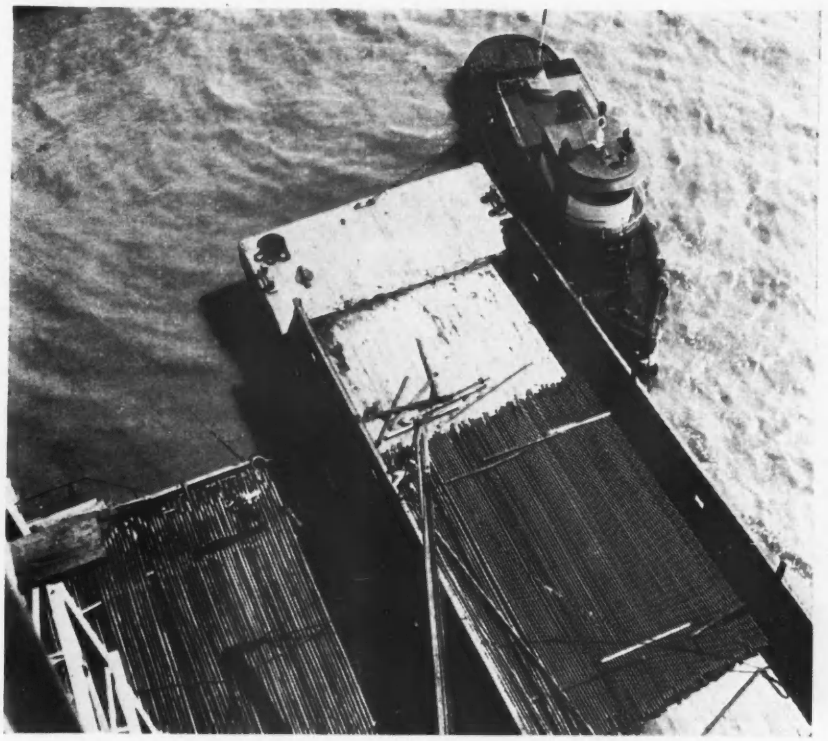
THE Texas oil industry directly supports with its purchases of supplies and equipment an important segment of Texas' industrial development. Of equal significance to the state is the service the industry has rendered by providing the raw materials for other industries. In an era when the production of synthetic materials from hydrocarbons is a major factor in U. S. industry, the existence of large natural gas reserves in Texas has proved to be the inducement which gave impetus to a large-scale industrial development within the state. Natural gas is not only a raw material for manufacturing processes but also a clean, efficient, economical industrial fuel, readily available throughout Texas.

Steel Purchases Large

Directly, the petroleum industry pays large sums to firms and individuals for an immense variety of services and products. These are so wide-spread that it would be difficult to assemble figures to reflect the extent of the industry's expenditures. Consider, however, the number of carloads of steel pipe required for the construction of Texas' 36,500 miles of pipe lines. Think of the drill pipe and oil well casing required in the drilling of a thousand wells; the numerous chemicals used by a refinery; the fabricated equipment in refineries and in natural gasoline and cycling plants; the technical services rendered by laboratories, geologists, exploration and oil well cementing companies; the brick and mortar for buildings; the facilities of railways and trucking companies engaged in transporting materials and products for the Texas oil industry; the airplanes; the automobiles; all those and more.

Contributes to Welfare of All

And then consider the jobs and payrolls created in Texas by the industry's expenditures for materials and services. And follow these through ever-widening circles of other jobs and other payrolls. You'll come, at last, to the inescapable fact that the oil industry in some way contributes to the welfare of every Texan, farmer and doctor, merchant and mechanic, housewife and schoolboy.



STEEL PIPE for pipe lines, drill pipe, and casing costs the Texas oil industry millions of dollars annually. Added to this are the other fabricated products used in refineries, on drilling rigs, and in natural gasoline and cycling plants. Transportation makes the bill even bigger.

CEMENT PRODUCTS, weighting materials, chemicals; automobiles, building materials, and all manner of equipment and tools add up to a tremendous annual total expenditure. Purchase of these items in large volumes by oil companies helps many other industries within the state.

By the way . .

They Have Retired

Enjoying the fruits of their labors in retirement are 16 employees who have forsaken active work with the Humble Companies during the past few months.

DANIEL D. HOFFMAN, pipe line engineer working out of the Houston Office, retired on October 31, 1947 . . . FORREST B. SMITH, assistant chief land man in the Exploration department, on November 1, 1947 . . . IRVIN E. OTIS, supply and generator man at Baytown refinery, on November 30, 1947 . . . MRS. ETHEL MCCUTHEON MCMILLIAN, janitress in the Houston Office, on December 18, 1947 . . . HORACE LOWE, janitor at Baytown laboratory, on December 24, 1947 . . . WALTER ROBERTS, first class brickmason at Baytown refinery, on December 29, 1947 . . . THOMAS E. BENSON, lease pumper-gauger at Anahuac, on January 24 . . . CLIVE E. SHERMAN, electrician helper at Baytown refinery, on January 16 . . . JOSEPH BOUDLOUCHE, compressor plant operator and gauger at Goose Creek, on January 15 . . . GEORGE B. LANGSTON, Pipe Line Company field dispatcher at Cisco, on January 13 . . . CHARLEY D. SPENCER, helper at Baytown refinery, on January 8 . . . WILLIAM O. MAYS, roustabout at Odessa, on January 4 . . . CALEB W. KEY, pipe liner at Webster Station, on January 1 . . . ROY S. CASE, tool pusher at Stratton, on January 1 . . . DAVID THOMSON, foreman at Houston Oil Terminal, on January 1 . . . and STEPHEN F. POWER, assistant chief dispatcher in Crude Oil Dispatching, Houston, on January 7.

Deaths

Since the last issue of THE HUMBLE WAY, death has claimed 20 Humble employees and four annuitants.

JOHN W. HELENIUS, 52, special watchman in the Marine department, died on November 17 . . . GUS BLANTON, 47, gas plant fireman in the East Texas division, on November 26 . . . ELMA R. JAY, 40, district gauger at Pampa, on November 29 . . . JOHN H. ENDACOTT, JR., 51, engineer at Ballinger Station, on December 6 . . . PAUL H. MORRISON, 59, shift supervisor at Baytown refinery, on December 14 . . . WILBORN G. PIERCE, 31, pipe liner at London, on December 20 . . . JAMES B. FERRILL, 28, first class painter at Baytown refinery, on December 21 . . . EDGAR W. BAKER, 61, engineer at Hastings Station, on December 21 . . . JAMES D. HEDGECOCK, 44, first class repairman at London Gas Plant, on December 29 . . . EDGAR Q. MESSER, 54, lease pumper-gauger at London, on January 5 . . . ROBERT C. DOBSON, 40, first class car repairman at Baytown refinery, on January 7 . . . MILLS F. PORTER, 29, helper at Baytown refinery, on January 11 . . . CLAUDE B. CULLETTE, 59, Houston district salesman, on January 25 . . . J. D. WARREN, 25, Houston truck salesman, on January 26 . . . ARTHUR L. AMMONS, 55, guard at Baytown refinery, on January 27 . . . WILLIAM B. FLINN, 55, engineer at Thompsons, on January 27 . . . CLIFFORD M. SCOTT, 50, first class rigger at Baytown refinery, on January 27 . . . J. E. CLAYTON, 36, stock gauger at Webster Station, on January 29 . . . FRANK STOCKTON, JR., 34, senior research geophysicist at Houston, on January 31 . . . and GIVEN W. WINNING, 62, Houston Office Treasury clerk, on February 3.

Annuitants who have expired during the past two months are: GEORGE R. COOKE, 68, Assistant Secretary and Assistant Treasurer of the Company until his retirement on September 25, 1944, died on December 10 . . . CHARLES F. HORN, 71, first class brick mason at Ingleside refinery until his retirement on June 4, 1941, died on December 29 . . . THOMAS R. BOUNDS, 61, district superintendent at Thompsons, died on January 14 . . . and MARSHALL M. BLACK, 56, truck driver at Webster Station died on January 20.

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Published every other month for employees and stockholders

HUMBLE OIL & REFINING COMPANY

P. O. BOX 2180, HOUSTON 1, TEXAS

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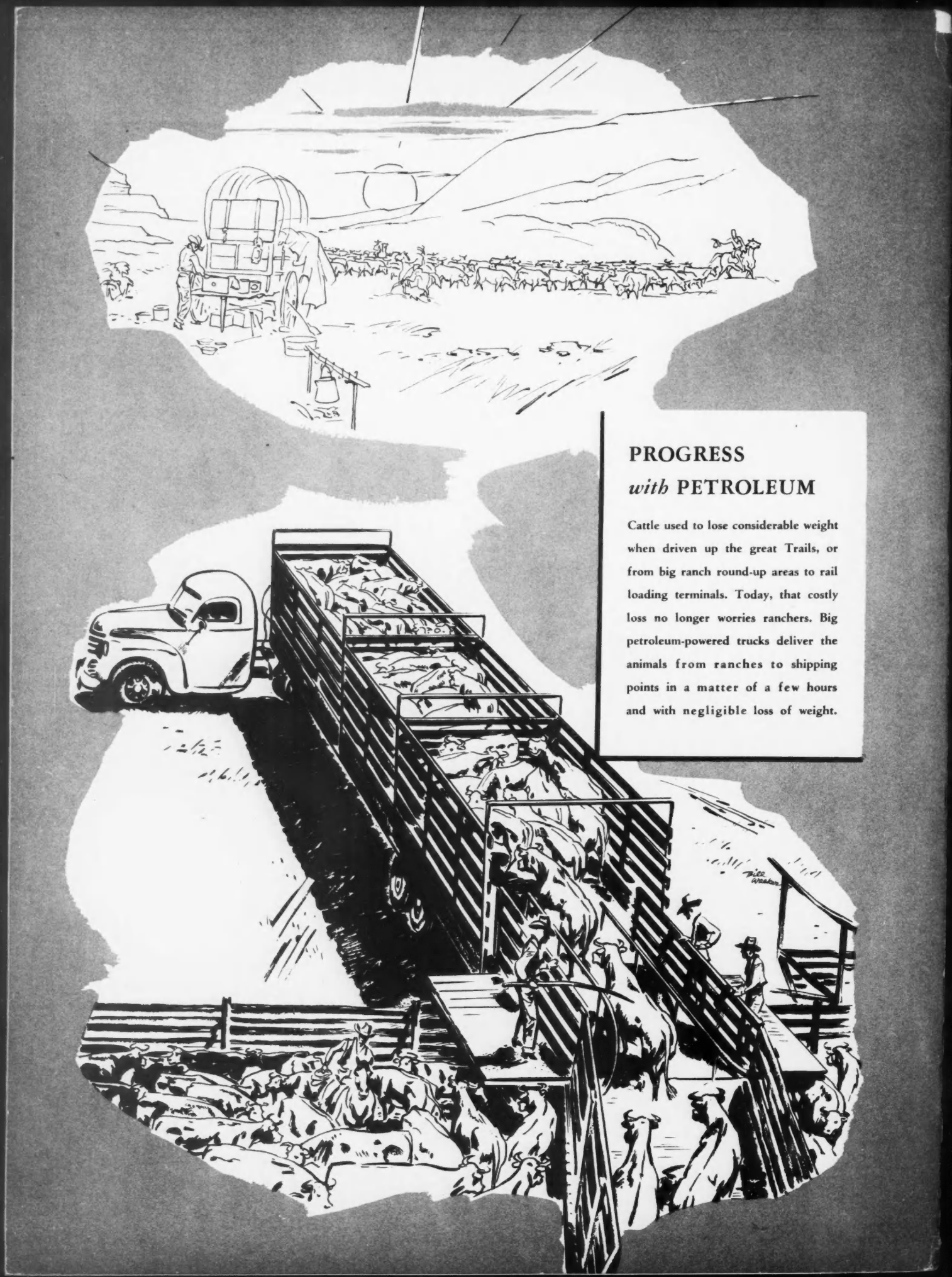
Would you like this picture?

A full color print of this unusual watercolor painting by Artist E. M. Schiwetz, will be sent to any reader who would like one. Prints of this November-December issue cover are 18 by 13 inches, and have generous margins to make them suitable for framing. Please address your request to THE HUMBLE WAY, Humble Oil & Refining Company, Box 2180, Houston, Texas.

RICH EARTH is turned as this conservation-minded Texas farmer reconditions terraces to protect his land from water erosion.



PROGRESS *with* PETROLEUM

Cattle used to lose considerable weight when driven up the great Trails, or from big ranch round-up areas to rail loading terminals. Today, that costly loss no longer worries ranchers. Big petroleum-powered trucks deliver the animals from ranches to shipping points in a matter of a few hours and with negligible loss of weight.